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A NEW CRAYFISH OF THE GENUS *PROCAMBARUS*
FROM SOUTHERN ALABAMA
(DECAPODA, ASTACIDAE)

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On 4 June 1940, Lewis Berner, Charles Benton, and the senior author collected four specimens of this new species from simple burrows in a drying creek-bed near the southeastern city limits of Haynesville, Lowndes County, Alabama. Not until April, 1958 were additional specimens obtained when Thomas L. Johnson and the senior author collected 109 specimens from five localities in Lowndes, Montgomery, and Wilcox counties, Alabama.

This crayfish is a member of the *Blandingii* Group and is closely related to *Procambarus acutissimus* (Girard, 1852) and *P. hayi* (Faxon, 1884). While the extent of its range is not known, failure to find it in collections to the north and east in habitats similar to those in which it occurs suggests that Montgomery and Lowndes counties lie near the northern and eastern limits.

We wish to acknowledge, with thanks, the assistance given by those persons mentioned above in collecting the specimens on which this description is based.

Procambarus lophotus,¹ new species

Diagnosis: Rostrum with small lateral spines or if spines absent margins interrupted; areola 12 to 17 times longer than broad with one or two punctations in narrowest part and constituting from 32 to 37 per cent of total length of carapace; postorbital ridges terminating cephalically in small spines or tubercles; lateral spines small, often tuberculiform; inner margin of palm of chela of first form male with one or two irregular rows

¹ *lophotus*, G.—crested. So named because of the helmet-like cephalic process of the first pleopod of the male.

of eight or nine tubercles; male with hooks on ischiopodites of third and fourth pereopods. First pleopods of first form male asymmetrically situated, reaching coxopodite of third pereopod and with a cephalolateral knob at base of terminal elements; no prominent cephalic hump or shoulder. Mesial process noncorneous, slender, subspiculiform and directed caudodistally and somewhat laterally; cephalic and caudal processes and central projections all corneous and directed caudodistally (Figs. 1 and 6). Annulus ventralis broader than long with a broadly S-shaped sinus that terminates caudally on an elevated prominence; cephalic portion hidden by multi-tuberculate extensions of the sternum immediately cephalic to annulus.

Holotype male, Form I: Body subovate, compressed laterally; abdomen narrower than thorax (15.5 and 18.8 mm respectively); width and height of carapace subequal in region of caudodorsal margin of cervical groove (18.8 and 18.4 mm).

Areola narrow (14 times longer than broad) with one or two punctations in narrowest part and constituting about 34.1 per cent of entire length of carapace.

Margins of rostrum not swollen, strongly convergent and with acumen indistinctly delimited from remainder of rostrum. Acumen narrowly triangular and reaching distal end of penultimate podomere of peduncle of antennule; upper surface of rostrum shallowly concave with a few widely scattered setiferous punctations. The usual submarginal row of setiferous punctations continuous onto acumen. Subrostral ridges weak and evident only at base of rostrum.

Postorbital ridges clearly defined, grooved laterally, and terminating cephalically in small tubercles; suborbital angle small and obtuse; branchiostegal spine small and tuberculiform. Lateral surface of carapace strongly granulate, lateral spines represented by a pair of tubercles that are only slightly larger than adjacent granulations.

Abdomen and carapace subequal in length (40.5 and 41.0 mm).

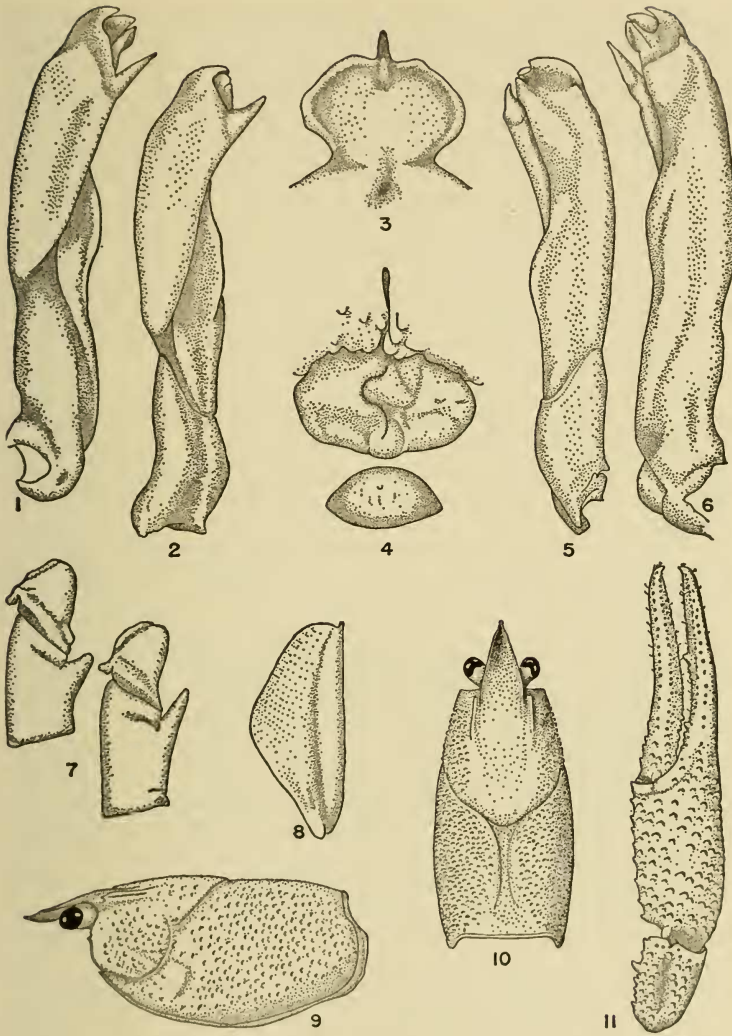
Cephalic section of telson with two spines in each caudolateral corner.

Epistome (Fig. 3) broader than long with a prominent cephalomedian spine and a median longitudinal carina near cephalic margin.

Antennules of the usual form with a small spine on lower surface of basal segment.

Antennae extend caudad to fifth abdominal tergum. Antennal scale (Fig. 8) of moderate width, broadest near midlength, and with a small spine at extremity of outer distal margin; lamellar portion with no distinct angles.

Right chela elongate, four times longer than broad and length of chela greater than length of carapace (42.5 and 41.0 mm). All surfaces of palm studded with squamous tubercles. Inner margin of palm with poorly defined rows of tubercles (in silhouette, nine tubercles may be seen extending above the surface). Lower surface of palm with one tubercle somewhat larger than the others at base of dactyl. Fingers not gaping, both with poorly defined submedian ridges above and below,



FIGS. 1-11

especially on dactyl. Opposable margin of immovable finger with a row of 16 knob-like tubercles, only the third and fourth from base of which are conspicuous; below this row at base of distal third is the usual prominent tubercle. Crowded minute denticles along entire length of opposable margin. Lateral margin with a row of squamous tubercles along proximal fourth and continuous with it to tip of finger a row of

setiferous punctations. Opposable margin of dactyl with an upper row of 14 knob-like tubercles along proximal two-thirds of finger; additional tubercles irregularly placed below this row between the fourth and twelfth tubercles; upper row with crowded minute denticles along distal three-fifths. Mesial margin of dactyl with a row of five tubercles along proximal fourth, distal to which continues a row of setiferous punctations. Mesial, upper and lower proximal portion of dactyl with a few scattered tubercles; elsewhere with rows of setiferous punctations.

Carpus of first right pereiopod about 1.7 times longer than broad with a shallow, slightly oblique, longitudinal furrow. Tuberculate except on lower and upper lateral surfaces. Usual semicircular arrangement of four tubercles between the upper and lower condyles distinct but none spiniform; remaining tubercles on mesial surface smaller and none conspicuously larger than others.

Merus of first right pereiopod with tubercles on upper, lower, and mesio-distal surfaces; elsewhere punctuate. Two prominent tubercles on upper surface near distal extremity. Lower surface with a mesial row of 16 spine-like tubercles and a lateral one of 13; additional tubercles flanking both rows. Lower margin of ischiopodite with a single row of six tubercles.

Ischiopodites of third and fourth pereiopods with hooks (Fig. 7); hooks simple and that on fourth heavier and opposed by a small knob on corresponding basipodite.

Coxopodites of fourth and fifth pereiopods with the usual projecting prominences—those on fourth knob-like and those on fifth tuberculiform.

First pleopod (Figs. 1 and 6) reaching coxopodite of third pereiopod when abdomen is flexed. (See *Diagnosis* for description.)

Allotypic female: Differs from the holotype in the following respects: Epistome slightly more irregular and lacking median carina; cephalic section of telson with three spines in the caudodextral corner. Inner margin of palm of chela with a well-defined row of eight tubercles; fingers gaping; opposable margin of immovable finger with a row of 11 tubercles along proximal two-thirds with fourth and fifth from base larger. Opposable margin of dactyl with 11 tubercles, the third from base largest and with a gap between it and the second that received the fourth tubercle on dactyl when fingers are closed. A single row of minute denticles along distal third of opposable margin of both fingers. (See *Measurements*.)

Annulus ventralis (Fig. 4) broader than long with an S-shaped sinus, the caudal extremity of which lies on a prominent caudomedian elevation. Sternum immediately cephalic to annulus produced caudally in multi-tuberculate prominences that overlap slightly on the median line.

Morphotypic male, Form II: Differs from the holotype in the following respects: Cephalic portion of telson with three spines in the caudo-sinistral corner. Carpus with the tubercles more acute and several on mesial surface larger than those elsewhere on podomere; hooks on ischiopodites of third and fourth pereiopods reduced and neither opposed by a knob on corresponding basipodite. First pleopod (Figs. 2 and 5) with

all terminal elements of holotype but noncorneous and not so distinctly delineated.

Measurements (in millimeters)

	HOLOTYPE	ALLOTYPE	MORPHOTYPE
Carapace:			
height	18.4	19.6	17.6
width	18.8	20.3	17.9
length	41.0	42.4	40.5
Areola:			
width	1.0	1.0	1.0
length	14.0	13.9	13.7
Rostrum:			
width	6.5	6.9	6.2
length	10.2	11.0	10.2
Right chela:			
length of inner margin			
of palm	15.9	9.6	11.3
width of palm	10.6	9.3	8.3
length of outer margin			
of hand	42.5	27.3	33.0
length of dactyl	24.0	16.2	18.8

Type locality: Roadside ditch, 3.4 miles northeast of Haynesville, Lowndes County, Alabama, on State Route 11. Here the road passes through gently sloping pasture lands with no trees in the immediate vicinity. The ditch, nowhere more than 1.5 feet deep, has a muddy bottom that supports a few grasses, particularly along the shallow margins. The current was sluggish to moderate at the time collections were made, and there is evidence that at times the ditch is dry. The open mouths of many burrows were observed before the water was clouded by dragging the seine over the muddy bottom. Specimens of *Procambarus lewisi* Hobbs and Walton (1959) and *Cambarus striatus* Hay (1902) were also collected here.

Disposition of types: The holotypic male, allotypic female, and morphotypic male are deposited in the U. S. National Museum (Nos. 104404, 104405, and 104406, respectively). A paratypic series, consisting of a first form male, a second form male, and a female are in the collection of Tulane University. The remaining paratypes are in the collection of the senior author at the University of Virginia.

Color notes: The ground color is pinkish-cream, almost flesh-colored. A pair of small purplish-tan spots occur immediately cephalic to the cervical groove near the attachments of the mandibular muscles, and extending caudally from the vicinity of the spots is a pair of narrow, longitudinal, grayish-green bands that extend to the caudal margin of the branchiostegites. The areola is distinctly pink delimited laterally by tan branch-

iocardiac grooves. The abdomen bears a broad, dorsomedian, wedge-shaped purplish-tan band, the apex of which lies on the fifth tergite; in addition, at the bases of each epimeron, which is pink, is a narrow longitudinal grayish-green bar. Viewed laterally, these bars are in line with the bands on the branchiostegites. The chelae are pinkish-cream with purplish-brown to greenish-black tubercles. Variations occur in the actual colors with a suffusion of tan in the pinkish areas and a darkening of the bands and spots, but the pattern seems to be constant.

Variations: The principal variations noted in this species seem to be associated with age. The young specimens are more spiniform, with well-defined marginal spines on the rostrum, lateral spines on the carapace, and spines on the cephalic extremities of the postorbital ridges. Too, the areola is proportionally broader in the immature animals, occasionally being only seven times longer than broad. None of the variations observed seem to be restricted to local populations.

Relationships: *Procambarus lophotus*, a member of the Blandingii Group (see Hobbs, 1942) has its closest affinities with *P. hayi* and *P. acutissimus*. It may be distinguished from the former by the position of the lateral knob-like prominence near the distal end of the first pleopod; in *P. hayi* it lies proximolateral to the caudal process and in *P. lophotus*, proximolateral to the cephalic process. The pleopod of *P. acutissimus* is almost straight and the tips of the cephalic process and central projection are directed approximately at right angles to the shaft of the appendage; in *P. lophotus* the entire appendage is bent caudally and the corresponding processes are directed caudodistally. The annuli ventrales of the three possess a caudomedian elevation on which the caudal extremity of the sinus terminates; however, the contour of the sinus of *P. lophotus* is decidedly more sinuous than in the other species.

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EXPLANATION OF FIGURES

Procambarus lophotus, new species. Fig. 1.—Mesial view of first pleopod of male, form I. Fig. 2.—Mesial view of first pleopod of male, form II. Fig. 3.—Epistome of male, form I. Fig. 4.—Annulus ventralis of female. Fig. 5.—Lateral view of first pleopod of male, form II. Fig. 6.—Lateral view of first pleopod of male, form I. Fig. 7.—Basipodites and ischiopodites of fourth and third pereopods of male, form I. Fig. 8.—Antennal scale of male, form I. Fig. 9.—Lateral view of carapace of male, form I. Fig. 10.—Dorsal view of carapace of male, form I. Fig. 11.—Distal podomeres of cheliped of male, form I.